

SUSPENSION DEVICE FOR  
THERMOPLASTIC CONTAINERS

Cross-Reference To Related Application

5     **[001]** This application is based on and claims priority from provisional patent Application Number 60/429,858 filed on November 27, 2003.

Technical Field

**[002]** The present invention relates to thermoplastic containers, and more particularly to a device for suspending thermoplastic containers.

Background of the Invention

10     **[003]** The use of containers for the storage of items is well known. Such containers are used to store a variety of articles, from food to general household items including everything from craft supplies to children's toys. Generally, such containers can be characterized by shape, size, and the presence or absence of a lid. Containers that do not  
15     include a lid require a separate sealing member, such as a plastic wrap or aluminum foil. Often, the plastic wrap or aluminum foil is loose or jostled during movement of the container, and hence, the container is usually not properly sealed or closed to prevent contents therein from spilling. Containers that include lids overcome this problem.

**[004]** In addition to the foregoing, many different types and sizes of containers exist.

20     When such containers are placed together in a confined space, such as a cupboard, cabinet, drawer, shelf, refrigerator, or the like, a disorganized condition can develop, preventing a user from easily locating a particular container. Further, as a user is attempting to locate a particular container, the container may be jostled, thereby causing one or more containers to fall off a supporting surface to the floor, resulting in breakage of the container and/or  
25     the articles stored therein and/or spilling of contents. Also, the containers are usually placed on top of one another, leading to an inefficient use of space. Still further, when containers are stacked on top of each other in an unconfined location, the containers tend to slide out of the stacked configuration and into a disorganized state.

[005] Carroll, U.S. Patent No. 4,241,668 discloses a frame for mounting a container and a cover below a supply shelf. The frame is suspended from spaced rails depending from the supply shelf by multiple hooks. The frame includes side beams with inwardly extending flanges for engaging the container and cover and allowing the container and lid to be inserted and removed from the frame.

[006] Bross U.S. Patent No. 4,632,472 discloses a slidable drawer system mounted below a shelf. Guide rails are mounted to the shelf and receive flanges of the drawer, wherein the drawer slides in and out of the guide rails. A finger is attached to each guide rail wherein the fingers contact the rear wall of the drawer to prevent removal of the drawer from the guide rails in a first direction. To completely disengage the drawer from the guide rails the fingers must be pushed upwardly away from the rear wall out of interfering relationship with the rear wall. A front portion of the drawer includes extending side walls that contact the guide rails as the drawer is being pushed inwardly, thus preventing the drawer from sliding out of the housing in a second direction.

[007] DeBruyn U.S. Patent No. 4,653,818 discloses a dry food storage container system wherein containers are supported by hanger plates that form a rack and are adapted to slide in and out of a cabinet. An upwardly projecting lug formed on the hanger plate restricts free sliding movement of the container. Each container may be laterally removed from or laterally inserted into an associated hanger plate when the container is lifted slightly over the lugs.

[008] Marino Jr. U. S. Patent No. 5,964,359 discloses a modular storage system for multiple containers including a base having a top wall, a side wall, and a bottom wall wherein the bottom wall has a front opening cutout. A jar with cover may be inserted into the opening wherein the cover rests on the bottom wall and suspends the jar with contents therefrom.

[009] Semon et al. U.S. Patent No. 6,056,378 discloses an add-on drawer and a method of mounting the same to a horizontal surface. The drawer includes a tray for storing items and at least two rails for slidably supporting the drawer. Each rail includes stops to prevent removal of the drawer from below the horizontal surface.

[0010] Design application U.S. D449,494 discloses an ornamental design for a hanging food storage container. A lid of the container is attached to a bottom portion of the

container and further includes a hanging portion by which the container can be suspended from a shelf or the like.

#### Summary of the Invention

5 [0011] In accordance with one aspect of the present invention, a suspension device includes a hanging member, a backing member extending transversely from the hanging member, and a suspension member extending from the backing member. A container is inserted into the suspension member and the hanging member is suspended from a shelf.

[0012] In accordance with another aspect of the present invention, a combination includes a suspension device including a hanging member, a backing member extending  
10 transversely from the hanging member, and a suspension member extending from the backing member. The suspension member includes a main member, at least one support member extending from the main member, and at least one wall member extending from the support member. The combination further includes a container, wherein the support member and wall member define interference fits with the container.

15 [0013] In accordance with a further aspect of the present invention, a method of suspending a container from a movable shelf includes the steps of providing a suspension device having a hanging member, a backing member, and a suspension member and inserting the hanging member of the suspension device over an edge of the shelf. The method further includes the step of inserting the container into the suspension device to  
20 hang the container in a non-horizontal position therefrom.

[0014] Other aspects and advantages of the present invention will become apparent upon consideration of the following detailed description and the attached drawings, in which like elements are assigned like reference numerals.

#### Brief Description of the Drawings

25 [0015] FIG. 1 is an isometric view of a first embodiment of the suspension device of the present invention;

[0016] FIG. 2 is a diagrammatic isometric view of a container in the suspension device of FIG. 1;

30 [0017] FIG. 3 is a side elevational view of the container in the suspension device of FIG. 1, wherein the suspension device is hung from a surface;

[0018] FIG. 4 is an isometric view of a first side of a second embodiment of the suspension device of FIG. 1;

[0019] FIG. 5 is an isometric view of a second side of the suspension device of FIG. 4;

[0020] FIG. 6 is a side elevational view of the suspension device of FIG. 4;

5 [0021] FIG. 7 is an isometric view illustrating the insertion of a container into the suspension device of FIG. 4;

[0022] FIG. 8 is an isometric view of a container in the suspension device of FIG. 4;

[0023] FIG. 9 is an isometric view a first side of a third embodiment of the suspension device of FIG. 1;

10 [0024] FIG. 10 is an isometric view of a second side of the suspension device of FIG. 9;

[0025] FIG. 11 is a side elevational view of the suspension device of FIG. 9;

[0026] FIGS. 12 and 13 are isometric views similar to FIGS. 7 and 8 illustrating the insertion of a container into the suspension device of FIG. 9;

15 [0027] FIG. 14 is an isometric view of a first side of a fourth embodiment of present invention;

[0028] FIG. 15 is an isometric view of a second side of the suspension device of FIG. 14;

[0029] FIG. 16 is an isometric view illustrating the insertion of a container into the suspension device of FIG. 14;

[0030] FIG. 17 is an isometric view of a container in the suspension device of FIG. 14;

20 [0031] FIG. 18 is a side elevational view of the container in the suspension device of FIG. 14, wherein the suspension device is hung from a surface; and

[0032] FIG. 19 is a side elevational view of a fifth embodiment of the present invention.

#### Description of the Preferred Embodiments

25 [0033] Referring to FIGS. 1-3, a suspension device 21 for a circular container 22 with a lid 24 mounted thereon (wherein the lid 24 preferably has a tab 25) includes a hanging member 26 and a backing member 28 integral with and extending perpendicularly from the hanging member 26. The suspension device 21 further includes a horseshoe-shaped suspension member 30 integral with and extending from the backing member 28.

30 Preferably, although not necessarily, the suspension device 21 includes one or more bracing members 32 that brace portions of the suspension member 30.

[0034] As seen in FIG. 3, the suspension device 21 is hung from a shelf 34 or other surface of a refrigerator, cabinet, closet, pantry, or the like for consumer use. This is accomplished by inserting the backing member 28 into a space between the shelf 34 and a side, rear, or front wall 38 such that the hanging member 26 is disposed above and rests on the shelf 34. This can be facilitated by pulling out the shelf 34, placing the hanging member 26 over the edge 36 of the shelf 34, and re-inserting the shelf 34. Optionally, the hanging member 26 can be inserted through a gap 39 between a shelf 34 and the wall 38 or other surface and pulled over the edge 36 of the shelf 34. During installation, it may be necessary to move the shelf upwardly a sufficient distance to allow the suspension device 21 to clear any shelf support(s) that may otherwise interfere with placement of the device 21. Once the shelf 34 is inserted, the backing member 28 is pressed against the wall 38 adjacent the shelf 34. A user may then insert the container 22 into an opening 40 disposed between legs 30a, 30b of the suspension member 30 such that a lip 42 of the container (and/or, optionally the lid 24) is captured between the legs 30a, 30b and is retained therebetween. The capturing of the lip 42 and/or the lid 24 may be accomplished in any suitable fashion to support the container 22 in the position shown in FIG. 3. As noted in greater detail below, one or more portions of the container 22 and/or the lid 24 and/or the suspension device 21 may flex or deform to permit the container and lid to move into the device 21 as the container 22 is being inserted into the suspension device 21.

[0035] Referring now to FIGS. 4-6, a second embodiment of a suspension device 47 according to the present invention comprises a suspension member 48 including a horseshoe-shaped main member 50, a support member 52 extending transversely from the main member 50, and a wall member 68 extending transversely from the support member 52. Preferably, the support member 52 is perpendicular to the main member 50 and the wall member 68 is perpendicular to the support member 52. The suspension device 47 further includes a backing member 49, a bracing member 51, and a hanging member 53, identical to the corresponding elements of the first embodiment. The support member 52 includes a curved main portion 54 that conforms to and abuts an outer periphery 56 of the main member 50. The support member 52 further includes outwardly flared resilient end portions 58, 60 on each side 62, 64 of a first opening 66. An inwardly directed wall member 68 extends transversely from the support member 52 and is parallel to the main

member 50. Preferably, (although not necessarily) the wall member 68, the support member 52, and the main member 50 are integral with one another.

[0036] The first opening 66 has a width W1 defined by a chord that defines the shortest distance between the end portions 58 and 60. Preferably, (again, not necessarily), the width W1 may be slightly smaller than the overall diameter of the circular container 22 to be supported by the suspension device 21. The container 22 may comprise a jar, bowl, glass, tub, basket, or like structure made of any material, such as thermoplastic, glass, fiberboard, etc... An inner periphery 70 of the wall member 68 defines a second opening 72 having a width W2 that is also somewhat smaller than the overall diameter of the container 22. Further, the width W2 is smaller than the width W1 of the first opening 66. The main member 50, the support member 52, and the wall member 68 form a cavity 74 for receiving a rim 76 of the circular container 22.

[0037] The suspension device 47 is mounted by hooking the hanging member 53 over the edge of a shelf as described above in connection with FIG. 3. Once the suspension device 47 is mounted, a user inserts the rim 76 of the circular container 22 with the lid 24 mounted thereon into the suspension member 48 as seen in FIG. 7. The circular container 22 is inserted through the first opening 66, whereupon the rim 76 of the container 22 with the lid 24 (and/or tab 25) engage and move the resilient end portions 58, 60 outwardly. Eventually, the end portions 58, 60 are displaced outwardly to a sufficient degree that the force resisting the insertion of the container 22 into the suspension member 48 suddenly decreases, and the container 22 moves into the suspension member 48 with a snap action and is retained therein by first and second interference fits.

[0038] Referring to FIGS. 6-8, the first interference fit is established between the container rim 76, the lid 24 (and/or tab 25) and the end portions 58, 60. Once the container rim 76 is moved beyond the first interference fit and is disposed in the cavity 74, the second interference fit is established between the container rim 76 and the wall member 68. The first interference fit prevents the container 22 from being removed from the suspension member 48 through the first opening 66 until sufficient removal force is exerted by a user to overcome the resisting force exerted by the end portions 58, 60. Further, the second interference fit prevents the container 22 from moving outwardly out of the suspension device 47 through the second opening 72.

[0039] In the foregoing embodiments, the container 22 is inserted into the suspension device at an insertion angle that is substantially parallel to the angle of the shelf 34 or other surface (typically horizontal). If desired, in any of the embodiments disclosed herein, the insertion angle may be inclined at a non-zero angle relative to the shelf 34 or other surface. For example, as shown by the dotted lines of FIG. 6, the suspension device 47 can include a suspension member 48 having a longitudinal center line 78 that is disposed at an angle of other than ninety degrees with respect to a longitudinal center line 80 of the first opening 66. Preferably, this arrangement results in the suspension member 48 being disposed at an angle of about 10 degrees relative to the angle of the shelf 34 or other surface, but almost any angle would be possible as long as there is proper room for attachment of the hanging member 53 and backing member 49 to the suspension member 48. Alternatively, or in addition, an angle between the longitudinal center line 78 of the suspension member 48 and a lower surface 82 of the hanging member 53 may be formed at other than ninety degrees to cause the insertion angle to be disposed at the desired angle when the device 47 is installed. In this case, the width W2 of the second opening 72 need not be smaller than the width W1 of the first opening 66 and the end portions 58, 60 need not be resilient.

[0040] A third embodiment of the present invention comprises a suspension device 121 seen in FIGS. 9-11. This embodiment is similar to the embodiment of FIGS. 4-6 with several exceptions. The suspension device 121 includes a backing member 149, a bracing member 151, and a hanging member 153, all of which are identical to the first and second embodiments. The suspension device 121 further includes a suspension member 130 including a horseshoe-shaped main member 150 and support members 152a-152e extending transversely with respect to the main member 150. Although five support members 152a-152e are depicted in this embodiment, any number of support members 152 is possible. The support member 152c includes a curved main portion 154 that conforms to and abuts an outer periphery 156 of the main member 150. An inwardly directed wall member 168 is carried by the support members 152a-152e and is parallel to the main member 50. Preferably, (although, not necessarily) the wall member 168, the support members 152a-152e, and the main member 150 are integral with one another.

[0041] A first opening 166 defined by end portions 178, 180 of the suspension member 130 has a width W3 defined by a chord that defines the shortest distance between the end portions 178, 180 and is slightly smaller than the overall diameter of the circular container 22 to be supported by the suspension device 121. All other elements of the suspension device 121 are identical to the suspension device 47 of FIGS. 4-6.

[0042] The manner in which the container 22 and lid 24 mounted thereon are inserted into the suspension member 130 as seen in FIGS. 12 and 13 is somewhat different from that of the suspension member 30. Specifically, the circular container 22 and lid 24 are inserted through the first opening 166 whereupon the end portions 178, 180 engage the rim 76 and lid 24 of the container 22 and move the rim 76 and lid 24 inwardly with a sufficient degree of force to allow the rim 76 of the container 22 to move past the end portions 178, 180 into the suspension member 130, wherein the container 22 is retained therein by first and second interference fits, which are defined above in relation to the suspension device 47.

[0043] Referring next to FIGS. 14-18, a suspension device 221 for a square-shaped container 222 with a lid 224 (preferably having a tab 225) includes a hanging member 226 and a backing member 228 integral with and extending perpendicularly from the hanging member 226. The suspension device 221 further includes a square-shaped suspension member 230 integral with and extending from the backing member 228. Preferably, the suspension device 221 includes one or more bracing members 232 that brace portions of the suspension member 230.

[0044] The suspension member 230 includes a square-shaped main member 250 and downwardly directed support members 252a-252c extending transversely with respect to the main member 250. The suspension device 221 further includes inwardly directed wall members 268a-268c integral with and carried by the support members 252a-252c, respectively, wherein the wall members 268a-268c are parallel to the main member 250.

[0045] The suspension member 230 further includes an opening 266 defined by the main member 250, the support members 252a-252c, and the wall members 268a-268c. The wall members 268a and 268c include interference members 270 adjacent the opening 266, wherein the interference members 270 prevent a square-shaped container 222 (seen in FIGS. 16-18), from inadvertently slipping out of the suspension member 230 when inserted therein.



[0046] As seen in FIG. 18, the suspension device 221 is hung from a shelf 34 in the same manner as discussed in detail above. Thereafter, the square-shaped container 222 and lid 224 are inserted into the suspension member 230 as seen in FIG. 16 by inserting a rim 276 of the container 222 (with lid 224 mounted thereon) into the opening 266 past the interference members 270. The square-shaped container 222 is thereafter pushed toward the support member 252b until a front portion 272 of the rim 276 and a front portion 274 of the lid 224 slide fully past the interference members 270 (FIG. 17 and 19). At this point, the user releases the square-shaped container 222 and the container 222 rests on the support member 252c. A first interfering relationship is established between the rim 276 and the lid 224, on the one hand, and the support member 252b and the interference members 270, on the other hand, in a first direction. A second interfering relationship is established between the rim 276 (and/or the lid 224) and the support members 252a-252c in a second direction transverse to the first direction to prevent the container 222 from moving out of the suspension device 221.

[0047] It should be noted that any suitably-shaped container 222 may be used in the suspension device 221 of FIGS. 14-16 (square, round, polygonal, rectangular, etc.). The container 222 is removed from the suspension device 221 by moving the container 222 toward the wall 38. The container can then be moved outwardly past the interference members 270 to permit the user to access the contents therein.

[0048] FIG. 19 depicts a fifth embodiment of the suspension device 321 of the present invention. The suspension device 321 includes a hanging member 326, a backing member 328 integral with and extending transversely from the hanging member 328, and a square-shaped suspension member 330 integral with and extending from the backing member 328. Preferably, the suspension device 321 includes one or more bracing members 332 that brace portions of the suspension member 330. In this embodiment, the suspension member 330 is suspended from a shelf 34 and has an insertion angle that is offset with respect to a horizontal line to retain a container therein. Preferably, the insertion angle is about 10 degrees with respect to the horizontal, but any angle is possible.

[0049] All of the embodiments of the suspension device of the present invention are preferably made of a thermoplastic material. Alternatively, any of the suspension devices may be manufactured from any suitable rigid material such as plastic, glass, metal, wood,

or any other similar materials. A preferable material is rigid, inexpensive, and has the ability to be readily formed into a desired shape. Suitable plastic materials include polypropylene, polyethylene, styrene, polystyrene, nylon, and a wide variety of other homopolymers and copolymers. Any suitable forming technique can be employed to form the suspension devices of the present invention, including, but not limited to, injection molding and thermoforming. The suspension devices are preferably integrally made but can also be formed in multiple parts that are snapped or pressed together during manufacture and assembly.

[0050] The suspension device can further have any geometric shape corresponding to the shape of the container inserted therein. For example, the suspension device may have a triangular shape or a rectangular shape for triangular and rectangular shaped containers, respectively, although the device need not have a shape corresponding to the shape of the container.

#### Industrial Applicability

[0051] The suspension device of the present invention allows a user to address a variety of home storage problems. First, the suspension device enables a user to store and organize containers to fully utilize available storage space. For example, in a refrigerator, closet, pantry, cabinet, or the like, the present invention allows a user to hang containers from a shelf, thus freeing up the shelf surface space for the storage of other items. This type of use also ensures that the containers are clearly in view and always in the same location, thus increasing the likelihood that any perishable food will be utilized before spoilage occurs.

[0052] Numerous modifications to the present invention will be apparent to those skilled in the art in view of the foregoing description. Accordingly, this description is to be construed as illustrative only and is presented for the purpose of enabling those skilled in the art to make and use the invention and to teach the best mode of carrying out the same. The exclusive rights to all modifications which come within the scope of the appended claims are reserved.